REMARKS

This amendment is responsive to the Office Action of August 9, 2007. Reexamination and reconsideration of the application are respectfully requested.

The Office Action

Claims 70, 72, 73, 75, 77, 79–84, 86, 150, and 156–159 stand rejected under 35 USC §102(e) as being anticipated by Kumar (US Patent No. 6,795,179).

Claims 74, 76, 85, and 151–155 stand rejected under 35 USC §103(a) as being unpatentable over Kumar in view of Ulrichsen (EP 0 876 852 A1).

The Claims of the Present Application Distinguish Over the Cited References

Claim 70 recites a method of separating, from a mixture of objects, CMYK-printed objects from objects which are not CMYK-printed. The CMYK-printed objects exhibit a specific spectral characteristic related to colour of the objects. The characteristic is detectable by spectral analysis but is not detectable by the naked eye or a colour camera. Using radiation, it is determined whether an object of the mixture exhibits the characteristic and thereby whether the object is or is not a CMYK-printed object. The determination is made by analysing, in a plurality of narrow wavelength bands in the visible spectrum, the radiation varied by said objects.

Kumar merely discloses a laser-induced breakdown spectroscopy (LIBS) system which, by definition, is a type of atomic emission spectroscopy which utilizes a highly energetic laser pulse as the excitation source. Furthermore, LIBS can analyze any matter regardless of its physical state (e.g., solid, liquid, or gas). Because all elements emit light when exited to sufficiently high temperatures, LIBS can detect all elements,

limited only by the power of the laser as well as the sensitivity and wavelength range of the spectrograph and detector. Operationally, LIBS is very similar to ARC/spark emission spectroscopy. As the Examiner may know, LIBS operates by focusing the laser onto a small area at the surface of the specimen. When the laser is discharged it ablates a very small amount of material which instantaneously generates a plasma plume with temperatures of around 10,000K–20,000K. At these temperatures, the ablated material dissociates (breaks down) into excited ionic and atomic species. During this time, the plasma emits a continuum of radiation which does not contain any useful information about the species present. However, within a very small time frame, the plasma expands at supersonic velocities and cools. At this point, the characteristic atomic emission lines of the elements can be observed.

Kumar fails to disclose separating from a mixture of objects, CMYK-printed objects from objects which are not CMYK-printed with the CMYK-printed objects exhibiting a specific spectral characteristic related to color of the object, where the characteristic is detectable by spectral analysis but not detectable by the naked eye, as recited in **claim 70**. In fact, Kumar fails to disclose, or even suggest, whereby frequencies that distinguish CMYK-printed objects can be detected in the visible spectrum. Neither a camera nor the naked eye is able to discriminate between these frequencies and Kumar only discloses characteristics related to color which are detectable by a camera or the naked eye. Instead, Kumar merely discloses a system for sorting irregularly shaped scrap metal particles by using the LIBS system to analyze the particles for their chemical composition such that, for example, different aluminum alloys can be sorted. Kumar discloses that the LIBS system is used to sort such scrap metal because the individual particles are not easily differentiated from each other by their color alone. Therefore, it is clear in Kumar that it is not a specific characteristic related to color of the object that is being detected. Instead, Kumar merely discloses that the actual elements of the scrap metal particles are analyzed by the LIBS system. Furthermore, the only characteristic related to color in Kumar is clearly one which would be detected by the naked eye by simply looking at the scrap metal particles. This cannot be the

specific characteristic referred to in independent **claim 70** which is not detectable by the naked eye. In fact, whenever color of the objects to be sorted in Kumar is mentioned, it is absolutely clear that it relates to color which is detectable by the naked eye or a color camera. In addition, as stated above, Kumar fails to disclose, or even suggest, whereby frequencies that distinguish CMYK-printed objects can be detected in the visible spectrum. Neither a camera nor the naked eye is able to discriminate between these frequencies and Kumar only discloses characteristics related to color which are detectable by a camera or the naked eye.

Furthermore, the Examiner points to col. 10, ll. 44–66 of Kumar as disclosing the feature of "determining comprises analyzing, in a plurality of narrow wavelength bands in the visible spectrum," as recited in **claim 70**. However, Applicants point out that col. 10 of Kumar states that the light collector includes a plurality of ultraviolet grade fused-silica optical fibers. In addition, Applicants point out that although col. 14 of Kumar may mention narrow wavelength bands, that passage fails to disclose that the bands are in the visible spectrum. Typically, in LIBS systems (and it is true of Kumar), the laser used is a ND-YAG laser which the skilled person recognizes as one which generates energy in the near infrared region of the electromagnetic spectrum. Therefore, Kumar fails to disclose determining in a plurality of narrow wavelength bands in the visible spectrum, as recited in **claim 70**.

The system disclosed in Kumar is one which results in a chemical analysis of the objects being sorted. This type of system is of little use in the claimed system of the present application. It is not desirable in the present application to know what the actual chemical composition is of the objects being conveyed. Instead, **claim 70** of the present application recites a method in which it is not necessary to know what the actual chemical composition is of the objects being conveyed, whereas it is desirable to obtain results upon the spectral properties of those objects and the colors printed upon them such that a de-inkable class of cellulosic material can be separated from the unwanted

material for recycling purposes. Such a system is much less expensive than a LIBS system.

For the reasons discussed above, **claim 70** and **claims 72, 73, 75, 76, and 150–154**, which depend therefrom, are patentable over Kumar.

Ulrichsen was merely cited as disclosing an analysis that may be applied to a wide range of materials and that both IR or visible light can be used dependent on the type of material to be sorted. However, like Kumar, Ulrichsen fails to disclose or suggest whereby frequencies that distinguish CMYK-printed objects can be detected in the visible spectrum. Neither a camera nor the naked eye is able to discriminate between these frequencies and Kumar only discloses characteristics related to color which are detectable by a camera or the naked eye. Therefore, for the reasons discussed above, neither Kumar nor Ulrichsen discloses, or suggests, separating from a mixture of objects, CMYK-printed objects from objects which are not CMYK-printed with the CMYK-printed objects exhibiting a specific spectral characteristic related to color of the object, where the characteristic is detectable by spectral analysis but not detectable by the naked eye, as recited in **claim 70**.

For the reasons discussed above **claim 70** and **claims 72, 73, 75, 76, and 150–154**, which depend therefrom, are patentable over the combination of Kumar and Ulrichsen.

Claim 77 recites a device for producing advancement of a mixture of CMYK-printed objects and objects which are not CMYK-printed. A determining arrangement uses radiation to determine whether the objects are or are not CMYK-printed objects which exhibit a specific spectral characteristic related to colour of the object. The characteristic is detectable by spectral analysis but is not detectable by the naked eye or a colour camera. A separating device separates from the mixture the CMYK-printed objects exhibiting the characteristic as desired parts of the mixture.

As discussed above, neither Kumar nor Ulrichsen discloses or suggests a device for producing advancement of a mixture of CMYK-printed objects and objects which are not CMYK-printed; a determining arrangement that uses radiation to determine whether the objects are or are not CMYK-printed objects which exhibit a specific spectral characteristic related to colour of the object, which characteristic is detectable by spectral analysis but is not detectable by the naked eye or a colour camera; and a separating device for separating from the mixture the CMYK-printed objects exhibiting the characteristic as desired parts of the mixture, as recited in **claim 77**. Therefore, **claim 77** and **claims 79, 80, 82–86, and 155–159**, which depend therefrom, are patentable over Kumar and the combination of Kumar and Ulrichsen.

CONCLUSION

For the foregoing reasons, it is submitted that the claims of the present application are in condition for allowance. Early notice thereof is respectfully requested.

Should the Commissioner decide that any fee or fee deficiency is due, the Commissioner is hereby authorized to charge any and all such fees, and/or credit any overpayments, incurred as a result of entering this amendment to Deposit Account No. 03-0172, Order No. 30316.04015.

Respectfully submitted,

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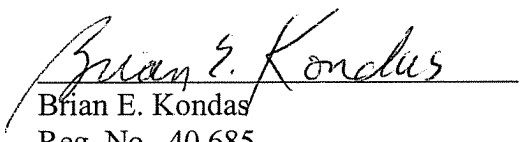

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